56. (New) The method of claim 55, said pattern structures characterized by substantially the same periodicity.

57. (New) The method of claim 56, further comprising the steps of providing at least one additional site including two regions located one above the other in two different layers, respectively, said regions containing patterned structures; illuminating said additional site with electromagnetic radiation and detecting a parameter of radiation diffracted from the patterned structures and analyzing the parameters obtained in said sites to determine an existing lateral shift between the layers.

58. (New) The method of claim 57 wherein at least one of additional sites comprises pattern structures at essentially right angle to the pattern structures of the measurement site.

59. (New) The method of claim 55, further comprising the step of providing additional sites including regions containing pattern structures in one of the layers.

60. (New) The method of claim 55 wherein said detecting the parameter of radiation diffracted from the patterned structures indicative of a lateral shift between the patterned structures comprises measuring said parameter as a function of wavelength.

61. (New) The method of claim 55 wherein said detecting the parameter of radiation diffracted from the patterned structures indicative of a lateral shift between the patterned structures comprises measuring radiation from the patterned structures at different angles.

62. (New) The method of claim 61, wherein said measuring measures radiation diffracted from the patterned structures at different angles.

63. (New) The method of claim 61, wherein said illuminating directs radiation to the site in a direction substantially normal to the regions.

64. (New) The method of claim 55 wherein said detecting a parameter of radiation diffracted from the patterned structures indicative of a lateral shift between the patterned

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structures comprises measuring said parameter as a function of a variable related to change of polarization amplitude and/or phase of the diffracted light.

65. (New) The method of claim 55 wherein the step of illuminating said site with electromagnetic radiation comprises illuminating with polarized light with different states of polarization.

66. (New) The method of claim 55 wherein said patterned structures are two-dimensional.

67. (New) The method of claim 66, the step of illuminating said site with electromagnetic radiation comprising illuminating with polarized light with different states of polarization.

68. (New) The method of claim 55, wherein said multi-layer sample comprises a semiconductors wafer.

69. (New) The method of claim 55, further comprising the steps of providing at least one additional reference site including two regions located one above the other in two different layers, respectively, said regions containing patterned structures; illuminating said additional reference site with electromagnetic radiation and detecting a parameter of radiation diffracted from the patterned structures and analyzing the parameters obtained in said sites to determine an existing lateral shift between the layers of said multi-layer sample.

70. (New) The method of claim 69, wherein said at least one additional reference site is on a second sample different from the multi-layer sample, and the steps of illuminating said additional reference site with electromagnetic radiation and detecting a parameter of radiation diffracted from the patterned structures are performed on said second sample.

71. (New) The method of claim 55, wherein the analyzing analyzes the parameter obtained in said site in association with a database to determine an existing lateral shift between the layers of said multi-layer sample.

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72. (New) The method of claim 71, further comprising providing information related to one or more of thickness, refractive index, extinction coefficient and critical dimension and constructing said database from such information.

73. (New) The method of claim 55, wherein said illuminating directs radiation to the site in a direction substantially normal to the regions.

74. (New) An apparatus for controlling alignment of layers in a multi-layer sample, comprising:

a measurement site including two regions located one above the other in two different layers of the sample, respectively, said regions containing patterned structures of certain known periodicity;

optics illuminating said site with electromagnetic radiation and detecting a parameter of radiation diffracted from the patterned structures indicative of a lateral shift between the patterned structures; and

a processor analyzing said parameter to determine an existing lateral shift between the layers.

75. (New) The apparatus of claim 74, said pattern structures characterized by substantially the same periodicity.

76. (New) The apparatus of claim 75, further comprising at least one additional site including two regions located one above the other in two different layers, respectively, said regions containing patterned structures; said optics illuminating said additional site with electromagnetic radiation and detecting a parameter of radiation diffracted from the patterned structures and processor analyzing the parameters obtained in said sites to determine an existing lateral shift between the layers.

77. (New) The apparatus of claim 74, wherein said optics measures said parameter as a function of wavelength.

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78. (New) The apparatus of claim 74 wherein said optics measures said parameter as a function of a variable related to change of polarization amplitude and/or phase of the diffracted light.

79. (New) The apparatus of claim 74 wherein at least one of additional sites comprises pattern structures at essentially right angle to the pattern structures of the measurement site.

80. (New) The apparatus of claim 74 wherein the optics illuminates the site with polarized light with different states of polarization.

81. (New) The apparatus of claim 74 wherein said patterned structures are two-dimensional.

82. (New) The apparatus of claim 74 wherein said multi-layer sample comprises a semiconductors wafer.

83. (New) The apparatus of claim 74 wherein said two regions of the measurement site are connected to a common substrate.

84. (New) A method for controlling layers alignment in a multi-layer sample, the method comprising:

(i) providing a measurement site including two regions located one above the other in two different layers, respectively, said regions containing patterned structures of certain known periodicity;

(ii) illuminating said site with electromagnetic radiation and detecting a parameter of radiation diffracted from the patterned structures indicative of a lateral shift between the patterned structures; and

(iii) analyzing said parameter to determine an existing lateral shift between the layers.

85. (New) A method for measuring layers alignment in a multi-layer sample, the method comprising the steps of:

(i) providing a measurement site including two regions located one above the other in two different layers, respectively, said regions containing patterned structures of certain known periodicity;

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(ii) illuminating said site with electromagnetic radiation and detecting a parameter of radiation diffracted from the patterned structures indicative of a lateral shift between the patterned structures; and

(iii) analyzing said parameter to determine an existing lateral shift between the layers.

86. (New) An apparatus for measuring alignment of layers in a multi-layer sample, comprising:

a measurement site including two regions located one above the other in two different layers of the sample, respectively, said regions containing patterned structures of certain known periodicity;

optics illuminating said site with electromagnetic radiation and detecting a parameter of radiation diffracted from the patterned structures indicative of a lateral shift between the patterned structures; and

a processor analyzing said parameter to determine an existing lateral shift between the layers.

87. (New) A method for measuring layers alignment in a multi-layer sample, the method comprising:

(i) providing a measurement site including two regions located one above the other in two different layers, respectively, said regions containing patterned structures of certain known periodicity;

(ii) illuminating said site with electromagnetic radiation and detecting a parameter of radiation diffracted from the patterned structures indicative of a lateral shift between the patterned structures; and

(iii) analyzing said parameter to determine an existing lateral shift between the layers.

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